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Michael J. Colomb
Site Executive Officer

September 2, 1998
JAFP-98-0285

United States Nuclear Regulatory Commission
Attn: Document Control Desk
Mail Station P1-137
Washington, D.C. 20555

Subject: **Docket No. 50-333**
LICENSEE EVENT REPORT: LER-98-008

**Automatic Reactor Scram Due to Low Reactor Water Level During
Restoration of "A" Condensate Pump**

Dear Sir:

This report is submitted in accordance with 10 CFR 50.73 (a)(2)(iv), "Any event or condition that resulted in a manual or automatic actuation of an engineered safety feature (ESF), including the reactor protection system (RPS)".

There are no commitments contained in this report.

Questions concerning this report may be addressed to Mr. Richard Plasse at (315) 349-6793.

Very truly yours,

A handwritten signature in black ink, appearing to read 'Michael J. Colomb'.

MICHAEL J. COLOMB

MJC:RP:las
Enclosure

cc: USNRC, Region 1
USNRC, Project Directorate
USNRC Resident Inspector
INPO Records Center

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LICENSEE EVENT REPORT (LER)

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05000333

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TITLE (4)

Automatic Reactor Scram Due to Reactor Water Level During Restoration of "A" Condensate Pump

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
08	03	98	98	008	00	09	02	98	N/A	05000
									N/A	05000
OPERATING MODE (9)		N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (Check one or more) (11)							
POWER LEVEL (10)		70	20.2201(b)		20.2203(a)(2)(v)		50.73(a)(2)(i)		50.73(a)(2)(viii)	
			20.2203(a)(1)		20.2203(a)(3)(i)		50.73(a)(2)(ii)		50.73(a)(2)(x)	
			20.2203(a)(2)(i)		20.2203(a)(3)(ii)		50.73(a)(2)(iii)		73.71	
			20.2203(a)(2)(ii)		20.2203(a)(4)		X 50.73(a)(2)(iv)		OTHER	
			20.2203(a)(2)(iii)		50.36(c)(1)		50.73(a)(2)(v)		Specify in Abstract below or in NRC Form 366A	
			20.2203(a)(2)(iv)		50.36(c)(2)		50.73(a)(2)(vii)			

LICENSEE CONTACT FOR THIS LER (12)

NAME

Richard Plasse, Sr. Licensing Engineer

TELEPHONE NUMBER (Include Area Code)

(315) 349-6793

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE).	X NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
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ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On 08/03/98, at 5:27 PM (EDT), an automatic reactor scram occurred while operating at approximately 70% power due to low reactor pressure vessel (RPV) water level following a degradation in feedwater flow. The degradation of feedwater flow was due to an inadequate filling and venting operation for the "A" condensate pump during restoration of the pump from a maintenance activity. When the "A" condensate pump suction valve was partially opened the operating condensate pumps became air bound. This caused one of two operating condensate booster pumps to trip on low suction pressure. The reactor subsequently tripped automatically on low RPV water level.

The plant responded as designed following the automatic scram and the transient response was bounded by previous analysis contained in the James A. FitzPatrick Final Safety Analysis Report. Corrective actions include a Post Transient Evaluation that was completed prior to start up, a correction to the filling and venting procedure for the condensate pumps, and an engineering evaluation and walkdown of the feedwater and condensate system to assess the affects of the resulting transient.

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EIIS Codes in []

Event Description

On August 3, 1998, at 5:27 PM (EDT), an automatic reactor scram occurred while operating in the "RUN" mode at approximately 70 percent power. A degraded feedwater flow condition caused reactor vessel water level to drop and reach the Reactor Protection System (RPS) trip setpoint for low reactor pressure vessel (RPV) water level. The degradation of the feedwater flow occurred due to an improper filling and venting of the "A" condensate pump while the pump was being restored to service following maintenance. When the condensate pump suction valve was partially opened, to allow filling of the suction piping, the operating condensate pumps became air bound resulting in a low suction pressure trip of the "B" condensate booster pump and alarms in the control room. The condensate pump suction valve was immediately shut. Control Room Operators were unable to restore reactor water level by taking manual control of the feedwater system. The Operators demonstrated conservative decision making by taking actions to insert a manual reactor scram. However, the timing was such that the automatic RPS low reactor water level trip caused the scram just prior to the insertion of the manual scram.

Important sequence of events leading up to the scram are presented below to provide a better picture of the times associated with above description. All RPV water levels are reference to inches above Top of Active Fuel (TAF). Times are based on individual recollections and plant alarm typer and sequence of events logs.

- 17:26:50 (Approx) - Plant operator starts to throttle open "A" condensate pump suction valve.
- 17:26:50 (Approx) - Loud noise observed in condensate pump area. Annunciators received in the control room.
- 17:26:50+ (Approx) - Control Room Operator (NCO1) notes lowering RPV level. RPV Low level annunciator (196.5" TAF) received in the control Room.
- 17:26:50 - Condensate pump discharge and condensate booster pump suction pressure "Lo" alarms.
- 17:27:10 - RPV water level Low alarm (182" TAF) received on EPIC (Plant Computer).
- 17:27:11 - "B" condensate booster pump trip.

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Event Description: (cont'd.)

17:27:11 - NCO1 informs Control Room Supervisor inserting a manual reactor scram.

17:27:12 - RPS "Lo" reactor water level (≥ 177 " TAF) automatic reactor scram initiated.

17:27:13 - Manual reactor scram switches actuated.

A Group II containment isolation [JM] occurred on "lo" (≥ 177 " TAF) level. The high pressure injection systems, Reactor Core Isolation Cooling (RCIC) [BN] and High Pressure Cooling Injection (HPCI) [BJ], initiated on "Lo-Lo" (≥ 126 " TAF) reactor vessel water level. HPCI did not inject due to the prompt recovery of RPV water level resulting in the HPCI injection valve remaining closed. The RCIC system started, aligned itself for injection, and injected to the RPV at 400 gpm. Both Reactor Water Recirculation pumps [4D] tripped on "Lo-Lo" level. RPV water level reached a low value of approximately 129 inches approximately 13 seconds after the scram and was restored to within the normal level (approximately 193 inches) by manual control of the feedwater system approximately 40 seconds after the scram.

Following the scram, four control rods did not immediately indicate "full in" and EOP-3, "Failure to Scram" was entered. Approximately one minute after the scram, all rods were verified fully inserted and EOP-3 was exited.

Cause:

The cause for this event was a procedure deficiency which provided inadequate written instruction (cause Code D). Specifically, OP-3, "Condensate System", Section G-1, provided technically inaccurate written instructions for placing a condensate pump in service following maintenance activities where the system had been drained. The procedure was written with the assumption that air trapped in the pump casing would be drawn into the main condenser. Contrary to this, air trapped in the pump was entrained in the condensate suction header flow path, and passed through the running condensate and condensate booster pumps.

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Cause: (cont'd.)

Previously, condensate pumps had been successfully returned to service after maintenance using the same written instructions. However, the previous maintenance activities (ex. pump repack) did not require a complete drain of the condensate pump well and system piping and did not cause any significant system perturbations. Personnel involved in returning the pump to service did not question the procedure based on the prior successful performances.

Extent of Condition:

An Extent of Condition evaluation regarding the inadequate operating procedure instructions for restoring a condensate pump to service after maintenance was completed prior to startup. The operating procedure OP-3, "Condensate System", was revised to include proper instructions for filling and venting a condensate pump. Since the feedwater and condensate booster pumps do not line-up directly to the condenser, the maintenance procedures and work instructions for these pumps contained the appropriate fill and vent guidance.

Engineering completed an evaluation of the transient and its impact on the condensate and feedwater systems. This included a walkdown of the condensate and feedwater piping and components. A few minor pipe support deficiencies were found but were not attributed to this event. No system operability concerns were identified.

Analysis

This report is being submitted in accordance with 10 CFR 50.73(a)(2)(iv), "Any event or condition that resulted in a manual or automatic actuation of an engineered safety feature (ESF), including the Reactor Protection System (RPS)".

The plant responded as designed following the automatic scram from approximately 70 percent power. There were no challenges to the reactor coolant pressure boundary or the fuel cladding integrity. This event and the transient response is bounded by previous analysis contained in the James A. FitzPatrick Final Safety Analysis Report, including various generation load reject transients, turbine trip transients, and reactor isolation transients. Reactor pressure, reactor vessel level, and neutron flux response were consistent with these analyses. Therefore, the safety significance of this event was minimal.

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Analysis: (con't.d)

The operators demonstrated conservative decision-making when they encountered feedwater flow degradation by taking the actions to insert a manual scram. During the transient there were no other protection or control systems out of service. Following the scram, four control rods did not immediately indicate "full in" and EOP-3, "Failure to Scram" was entered. The operators verified that all control rods had inserted by observing APRMs downscale, the full core display, individual rod position indications, and the plant computer (EPIC).

Corrective Actions:

1. A Post Transient Evaluation was performed and completed prior to plant startup.
2. An Extent of Condition evaluation regarding the inadequate operating procedure instructions for restoring a condensate pump to service after maintenance was completed prior to startup. The operating procedure OP-3, "Condensate System", was revised to include proper instructions for filling and venting a condensate pump.
3. Engineering completed an evaluation of the transient and its impact on the condensate and feedwater systems. This included a walkdown of the condensate and feedwater piping and components. A few minor pipe support deficiencies were found but were not attributed to this event. No system operability concerns were identified.
4. Plant personnel were briefed on the details of this event and the lessons learned during a weekly tailgate meeting. In addition, the Training Program Review Committee will review this event for development of a case study to reinforce the need to closely evaluate plant procedures and their applications to prevent similar occurrences. **(Scheduled Completion Date: February 1, 1999)**

Lessons learned from this event were applied to a subsequent emergent equipment problem involving a partial loss of feedwater heating. The restoration from this condition was performed successfully; error free, with no plant impact.

Similar Events:

There have been no previous reactor trips caused by a degradation of feedwater flow during restoration of a condensate pump to service. LERs 95-13, 93-009, 90-009 describe reactor scrams caused by feedwater control system circuitry interruptions causing degraded or loss of feedwater conditions.

CATEGORY 1

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SUBJECT: LER 98-008-00:on 980803,automatic reactor scram occurred due
to low RPV water level following degradation in feedwater
flow.Completed post transient evaluation prior to startup &
correcting filling & venting procedure.W/980902 ltr.

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